

# DISCOVERY OF STRANGE USES FOR COUNTRY'S WASTE MAKES DEPARTMENT OF AGRICULTURE VERITABLE NATIONAL MINT

## BY-PRODUCTS MADE FROM REFUSE YIELD MOUNTAIN OF GOLD

Brilliant Experts Working for Uncle Sam Seek Out Industrial Junk and Search for Methods of Utilization—In Many Cases "Reclamations" Are Better and Cheaper Than the Main Products Already Established.

By HARRY SHREVE.

ONE branch of the Government is accomplishing wonders in teaching the citizens of the country how to make the most of the great resources of the United States.

While wars and rumors of wars, with their resultant waste and destruction, hold half of Europe in their deadly grip; while the harvest fields of many countries lie barren and untilled; while the grim specter of starvation stalks abroad—wise old Uncle Sam, through the medium of the Department of Agriculture, is telling his children how to save and conserve, how to make useless things useful and turn waste into money.

The average man knows little or nothing of the Department of Agriculture or its work. In his mind the department is associated with some place where he can get free seeds once or twice a year. He pictures its workers as being grubby-looking men, wearing huge spectacles and forever chasing after bugs and butterflies.

He's wrong. Numbered among the hundreds of experts and field agents employed in this branch of the Government work, are some of the most brilliant men in the world in their respective lines. The field they cover runs the length and breadth of the country and their duties embrace many strange and interesting subjects.

### COVERS VAST FIELD.

Each subject would make a story in itself and volumes would be required to give the details of the combined work of the department. This article will deal only with that branch of the chemical bureau which is endeavoring to teach the people of the country the advantage of domestic economy. Experts in this particular field have proven by actual demonstrations that millions of dollars can be saved each year by utilizing what farmers and fruit growers have been throwing away.

Down in the lower portion of Virginia and in most of the other Southern States, grows a bush known as "Casino." It grows without cultivation or attention and is so common that it is considered as being virtually a weed. Back in the days of the civil war when the soldiers in gray were on mighty short rations, they picked the leaves of this bush and brewed a sort of tea which they found to be very stimulating. During the late war, when there was a slight chance that our supply of tea and coffee would be cut off, the experts of the Department of Agriculture began experimenting with the "Casino" bush.

Their experiments resulted in producing a tea that greatly resembles the regular household tea in taste and appearance. When fed, there is no difference in the taste of the two, but when served hot, there is a slightly unfamiliar taste. It would require the confirmed tea hound, however, to notice the difference. Not satisfied with this, the experts continued their efforts. The later experiments produced a delicious soft drink with invigorating qualities. This drink is known as "Casino." It has been patented and protected in the name of the people of the United States. Any person or firm can make it for either domestic or commercial use, but no firm or person can exclusively control the manufacture or sale of it. "Casino" far exceeds many of the soft drinks on the

market, both in taste and stimulating properties.

### SWEET POTATO FLOUR.

The sweet potato is a favorite dish on many tables and yet if you showed your wife some of the sweet potatoes, just as they come out of the ground in the Southern States, and asked her to prepare them for dinner, she'd be perfectly within her right in applying for a divorce on the grounds of cruelty. Some of the sweet potatoes that grow down South are wonderful sights to behold. They are almost a yard long, possess a joint for every inch, and have as many twists and turns as a Boston side street.

It would require a half-hour and try the temper of the most saintly housewife to peel one or them. These potatoes are never allowed to reach the market and up to the time the experts from the Department of Agriculture began studying them, they were thrown away, a dead loss to the farmer.

At first a sweet potato flour was sought, but the attempts were disappointing. The same methods as used in the production of the white potato flour were employed, but after many experiments it was found the sweet potato meal possessed qualities that made it impossible to keep the flour without spoiling. The experts again got busy and now there is available for public use a sweet potato syrup which both in taste, quality and sweetness far exceeds corn syrup, and can be manufactured and sold much cheaper.

### USED IN CANDY.

Besides making a welcome addition to many tables where hot cakes and muffins play a prominent part, it is expected the syrup will be a great boon to bakers and candy makers. The Department of Agriculture has sent samples of the syrup to all manufacturers who use syrup or sugar in their trades and it is expected it will be used quite extensively commercially.

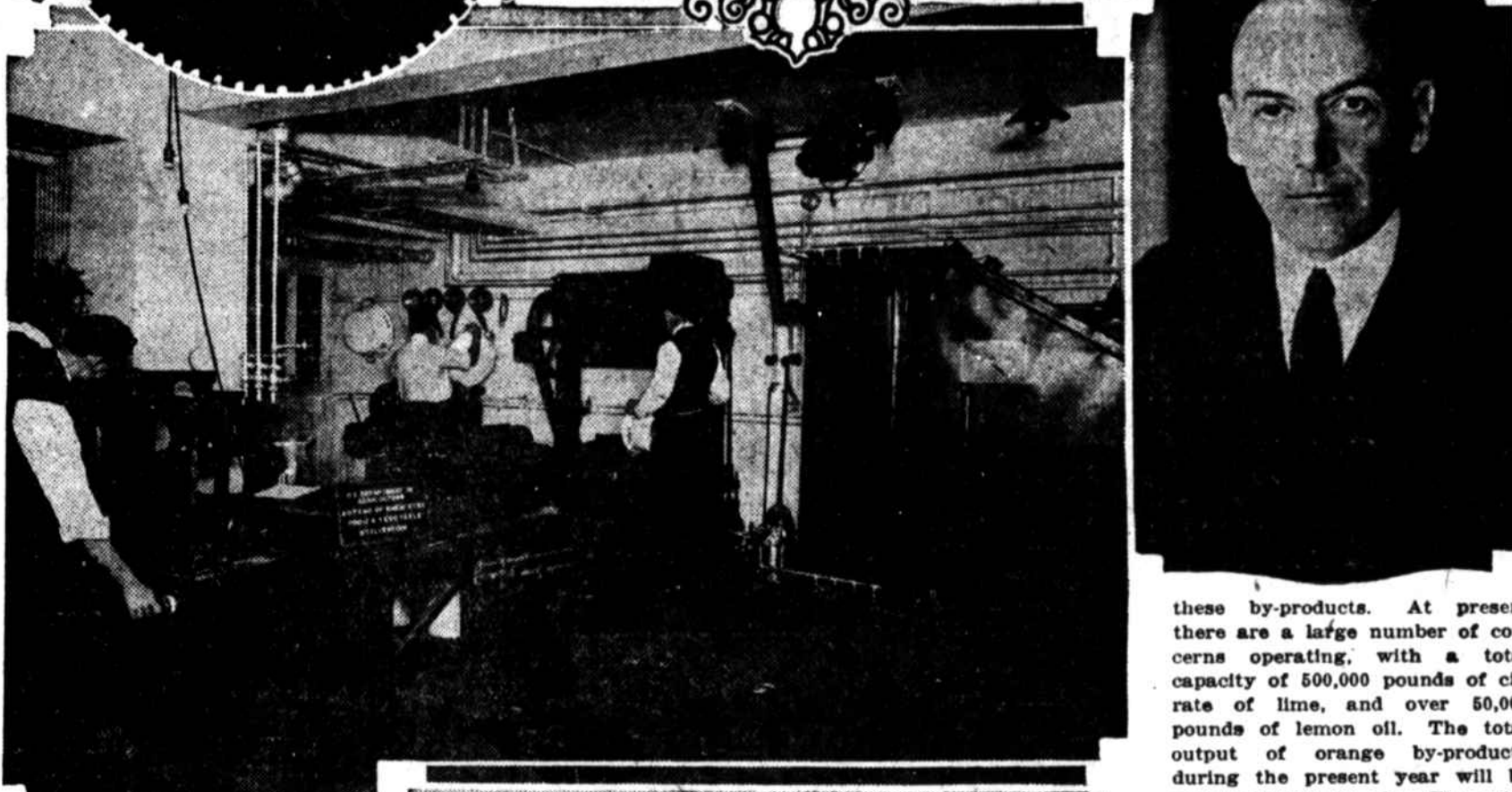
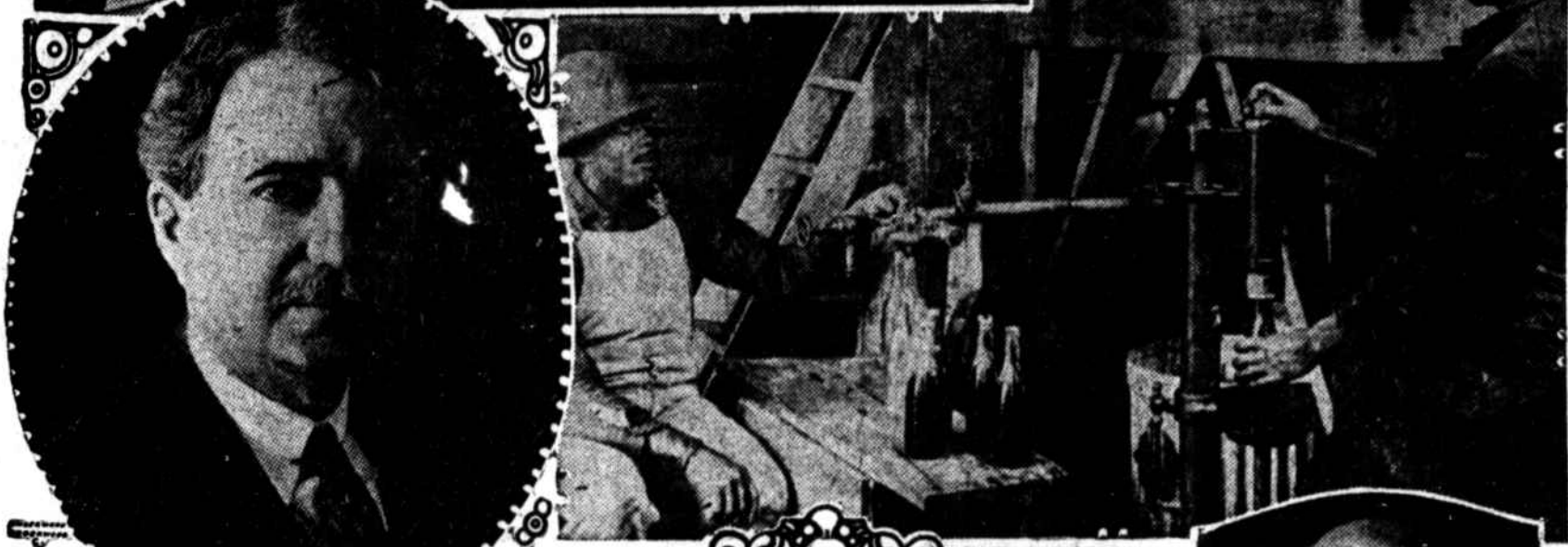
The fruit growers of Florida, California and other States have always banked heavily upon the assistance of the experts of the Department of Agriculture and they have never been disappointed. In a thousand ways the planter has been assisted.

This is particularly true of the planters in those States where oranges, lemons and grape fruit are grown. Only the very finest specimens of these fruits have ever been shipped to the Eastern markets.

For years the disposition of culls and the smaller fruit, which, while perfect, were not suitable for shipping purposes, has been a vexing problem.

SOME close-ups of the activities in the Bureau of Chemistry at the Department of Agriculture. Upper left: Sampling beverage made from cassina, a plant which grows abundantly in wild state throughout South Atlantic and Gulf States. Upper right: Making syrup from sweet potatoes. Dr. W. W. Skinner (in oval), assistant chief of the Bureau of Chemistry, and W. G. Campbell, acting chief of the bureau, who directs work of enforcement of the food and drug act. Below are shown laboratory and a view of cassina bushes.

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Minor defects, such as small bruises or punctures from thorns or gravel or rough boxes, destroy the shipping value of such fruit and such defects offer points for infection to various bacterial and fungous growths which cause decay. Fruit that is too small, too large, unsightly or misshapen also has a doubtful shipping value. The amount of this waste amounted to about 3 per cent of the total crop and the planter considered himself lucky if he could secure \$4 or \$5 a ton for this class of fruit.

In 1914 experts from the Department of Agriculture began to give the matter their attention. A laboratory was erected at Los

Angeles, and now all of the fruit is utilized to great advantage. Among the by-products from the fruit are vinegar, marmalades, marmalade stock, candied peel, citrate of lime, citric acid, orange

oil and lemon oil, the last named being used extensively by the drug trade.

When these investigations were started there were but one or two small firms struggling with

these by-products. At present there are a large number of concerns operating, with a total capacity of 500,000 pounds of citrate of lime, and over 50,000 pounds of lemon oil. The total output of orange by-products during the present year will be over 7,000,000 pounds. The price of the culls and damaged fruit now ranges from \$30 to \$40 a ton.

The Government laboratory keeps in close touch with the manufacturers, advising them in processes and assisting them in establishing their business.

Even the lowly corn-cob has not been overlooked by Uncle Sam's workers. After many experiments they have perfected a process by which they are enabled to extract sugar xylene from it. This extract is very valuable to the gum trade, being used in making many articles of an adhesive nature. Studies on the utilization of this sugar has revealed a simple process for its conversion into gulinic lactone, which also offers possibilities of extensive commercial use.

## SWEET POTATOES, ONCE SCORNE, NOW TURNED INTO FLOUR

High Grade of Syrup, Used for Griddle Cakes and Manufacture of Candy, Comes From Southern Potatoes Heretofore Considered Valueless—Fruit Growers Save Thousands of Dollars Through Experiments.

Dried peaches, apples and other fruits are all right, but the experts have been thinking for some time that their appearance might be improved. Look at a fresh-tinted peach or apple on the counter of the fruit stand, then take a gaze at the dried article as it is handed out by the pound in the grocery stores, and you will understand why the department experts think the dried article should be dressed up.

With this object in view, they have been working on a process that will allow the extraction of the water from the fruit which will only slightly interfere with the original shape and appearance. By this new method, a much larger percentage of the food value of the fruit will be retained.

Another line where the knowledge of the department expert has proven very valuable to the farmer is in the prevention of grain and mill elevator and cotton gin explosions. Over six thousand plants were visited last year and a number of recommendations made to the companies providing greater safety from dust explosions were adopted.

It is believed that these recommendations were responsible for the prevention of the loss of large sums of money through explosions and fires. Experts from the Bureau of Chemistry are even now experimenting in utilization of the waste products of leather and doubtless it will be only a matter of a short time before all of the

old shoes in the country will be made into something valuable.

### WATCHING FOR WASTE.

These are only a few of the fields that occupy the attention of the Department of Agriculture workers. They are scattered all over the country watching for the slightest indication of industrial waste and when they find it, they cork the leak.

The Chemical Bureau also has charge of the enforcement of the Federal Pure Food and Drug Law. It is ready at any moment to give you all the information you want on fats and oils of any kind. If you want to know anything about the nutritive value of proteins, write to the Chemical Bureau and you'll get the information in the next day's mail.

The subject of sea foods is like an open book to the bureau workers. They can tell you what kind of fish to eat and when to eat it. They will be glad to furnish you with information and advice that will cure your horses, cattle and chickens of almost any disease. They know all about dairy products and will tell you the best way to raise hogs and how and what to feed them. They know the composition of every soft drink on the market and are ever willing to impart that knowledge to you. Any kind of a plant, from a tomato to a watermelon, can't poke its head out of the ground without the boys of the department being on hand to investigate and experiment with it.

## CHICAGO COMPLETES JOB OF RENOVATING MUSEUM FOSSILS

By A. J. LORENZ,  
Universal Service Staff Correspondent.  
CHICAGO, Aug. 26.

"THAT'S better now," trumpeted the ectoplasm of the Columbian mammoth. It was the first sound the giant fossil in the Field Museum of Natural History had made since its prehistoric bones had been assembled thirty years ago.

During all that time the giant skeleton had stood, with its neck craned in an unnatural position. Officials of the museum recently took pity on it and relieved the strain. While they were at it, they scraped several coats of white paint from the massive bones and the big ivory tusks.

After several million years bones are apt to soften, so that it was found necessary to harden them. In short, the mammoth was given a new lease on its prehistoric life.

How the work was accomplished is amply explained in the annual report of the museum, which has just been issued.

A complete job of renovating the museum fossils included the restoration of the Colossochelys, or mammoth turtle, of antediluvian days; the Calchadoron, shark and a dinosaur.

Among the acquisitions to the museum during the past year are

Chinese maps, made by cartographers who lived a hundred years before the discovery of America; reproductions of prehistoric men, including busts of the Pithecanthropus, the Neanderthal and the Cro-Magnon ancestors; Japanese, Indian, Turkish and Javanese swords and daggers.

Perhaps the most interesting of the new gifts are the 200 "surimono," rare Japanese color print greeting cards for New Year's Day and other festival occasions; samurai ceremonial costumes; Chinese tapestries and painted scrolls; fossil plants from the eocene beds of Louisiana, and mounted Canadian bighorns, as well as skulls and horns of South African game animals.

The Japanese surimono were the gifts of Miss Helen Gunsaulus, in memory of her father, Frank W. Gunsaulus.

The surimono collection is a very rare one, according to Dr. Bertrand Laufer, curator of the Far Eastern section of the museum. The various prints show in a wealth of detail the customs, costumes and popular traditions of ancient Japan, delineating every step in the important New Year's celebration, with its many games and festivals. Pictured also are incidents taken from folklore, history and classical drama of Japan, while the flowering cherry tree, the snowy peak of Fuji and the nightingale's first song have quite as frequently inspired the artist.

## VISITORS AT LOURDES MARVEL AT MODERN MIRACLES PERFORMED IN "CAVE OF THE CANDLES"

VERY old man, bowed, both by both reason of his years and constant bending over his unchanging toil, was placing lighted candles in position at the famous Grotto at Lourdes when our motor car drove up within short walking distance of the celebrated pilgrimage shrine at the foot of the Pyrenees.

None of the sights of Lourdes had for me the fascination of this "cave of the candles." One could not help but be interested in the aged acolyte who, standing amid the amber glow of the many lights, suggested a figure that, somehow or other, had strayed out of the Middle Ages. Looking at him, I rubbed my eyes to be sure that I was living in the troublous year of 1922.

In spite of my insistent gaze, he went on with his work slowly,

methodically, efficiently, setting first this candle in place in the flaming candelabra, and then that. On his face there was an expression of such small concern for all but his immediate surroundings as to give the impression that for him, indeed, this world of sorrows did not exist beyond the confines of the little grotto, with its dancing candle-light shadows, where, sixty-four years ago, the vision of Our Lady is said to have appeared to the French peasant girl, Bernadette Soubirous.

They told me that this worn veteran had been adjusting the candles of devout pilgrims for longer years than most people in Lourdes cared to remember. In truth, his story of service might almost be called the story of Lourdes itself.

When he was very young the first "miracles" of the healing by the sacred waters of the Grotto

had been reported; now that he was old one might almost argue from his impassive, abstract look that the rapture of revelations had passed away, leaving in its stead something calmer—an unshaken and undisturbed belief in the permanence and continuance of the "cures" of Lourdes.

### PAIN-WEARY PILGRIMS.

"Bathe in the waters of the Grotto," is, broadly, the message of the shrine, "and by the grace of Our Lady you shall be healed."

The ever-burning candles, fixed for an endless procession of suppliants, are a monument to the persistency of human faith in an age of withering scepticism and fading beliefs.

Year after year, how many pilgrims has this venerable ministrant not seen pass, with pleading eyes, before the rail of the Grotto? Rich and poor, old and young, men and

women, and, all too frequently, children, alike buoyed up with the same hope that their prayers to be healed will be heard and they shall be freed from their bodily sufferings. He has seen them limp by, or carried by, a long, sad, wistful, grey pageant of pain, and he has heard their passionate evocation, "Ave, ave, ave, Maria!" And there have been days when he has seen a mournful face suddenly grow radiant with the inward conviction that the prayer has been answered and the hoped-for "miracle" taken place: "I am cured."

Whatever hopes are fulfilled, whatever hopes are frustrated, the business of Lourdes goes on. It is the same this year, it was the same last year, and it will be the same next year. And this bent old figure, untiringly feeding the huge candelabra of the Grotto with the humble votive offerings of the

pilgrims, is symbolical of the spirit of Lourdes.

### LOVELY SCENERY.

You come and go, but the shrine remains, perhaps for all times. Just as he takes your candles this year, so he will take the candle of some fellow-sufferer next year. For there is no finality to the army of affliction which looks to Lourdes for salvation.

It is nothing for the Shrine to have as many as 600,000 pilgrims in one year.

Even Lourdes has its seasons. I arrived in the quiet time; there were not many people about. The place of "miracles" was comparatively deserted. Only a few rain-drenched pedestrians were to be seen scurrying across the great square, which, on occasions such as the passing of the Holy Sacrament, echoes with the agony of prayer, rising like incense.

I was, therefore, spared the painful incidents associated with the customary procession of lame, paralytic, and helpless to the Grotto. Instead, there was the rare opportunity of an uninterrupted, tranquil view of the solemn sights, without the saddening effect produced by queues of sufferers.

First my eye took in the great, towering heights of the Pyrenees, capped in dark, sullen clouds. Then in the valley below the stately Basilica, with its graceful spire, pointing a white, encouraging finger towards heaven. Then the Byzantine-like Church of the Rosary, where the intensely wrought expression of the few worshippers present was almost painful to behold.

My eyes wandered round the great square in front of the church, and I thought of the distressing scenes that yearly, dur-

ing the height of the pilgrimage season, take place there. Then in the rain I made my way slowly to the Grotto, scooped out of the frowning rock, its walls and roof black with the smoke of candles burnt for so many years.

Women who were entering the Grotto quickly occupied themselves in rapt prayer, their eyes fixed in ecstasy on the huge, flaming candelabra. To the left of the Grotto there ran from a tap cool, crystalline water, flowing from the spring, which is said to have miraculously gushed when the peasant girl, Bernadette, traced on the rock the sign of the Cross.

French women, who had obviously come a great distance, were filling little glass bottles with the treasured water, which, no doubt, they were to hand to some sufferer unable to make the pilgrimage, but hoping to receive, at the hands

of a deputy pilgrim, the priceless gift of health.

By the side of the grotto, mouldy from the ravages of time and weather, hung the crutches and artificial supports of the lame and paralytic, who, having bathed in the waters of the Shrine are said to have been completely healed and to have left blind these tokens of suffering, as evidence of the "miracles" that, in their cases, had been wrought.

Surely this is the strangest museum in the world, filled as it is with these silent witnesses of great faith, greatly rewarded, before which even the scoffer is dumb.

The town itself thrives wondrously. There are all the accessories of a great health rendezvous—fine hotels, up-to-date restaurants, and scores of shops retailing mementoes bearing the image of Our Lady.